



#4

## Sequence Listing

<110> Nikolics,  
McFarland, Keith C.  
Segalo, Deborah L.  
Seeburg, Peter H.

<120> Glycoprotein Hormone Receptor Molecules

<130> P0576P1C2

<140> US 09/877,804

<141> 2001-06-07

<150> US 08/207,814

<151> 1994-03-07

<150> US 07/781,153

<151> 1991-10-31

<150> US 07/347,683

<151> 1989-05-05

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gca gtg ctg ctg ctg aag cct tca cag ctg cag tcc cga 124  
Ala Val Leu Leu Leu Lys Pro Ser Gln Leu Gln Ser Arg  
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gag ctg tca ggg tgg cgc tgc ccc gag ccc tgc gac tgc 163  
Glu Leu Ser Gly Ser Arg Cys Pro Glu Pro Cys Asp Cys  
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gca ccg gat ggc gcc ctg cgc tgt cct ggc cct cga gcc 202  
Ala Pro Asp Gly Ala Leu Arg Cys Pro Gly Pro Arg Ala  
45 50

ggc ctc gcc aga cta tct ctc acc tat ctc cct gtc aaa 241  
Gly Leu Ala Arg Leu Ser Leu Thr Tyr Leu Pro Val Lys  
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gta att cca tca caa gct ttc agg gga ctt aat gag gtc 280  
Val Ile Pro Ser Gln Ala Phe Arg Gly Leu Asn Glu Val  
70 75

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 Val Lys Ile Glu Ile Ser Gln Ser Asp Ser Leu Glu Arg  
 80 85 90

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 95 100 105

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 135 140

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 Val Thr Lys Ile Ser Ser Ser Glu Phe Asn Phe Ile Leu  
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acc aaa ttg cag gcc ctg ccg agc cac ggg ctg gag tcc 787  
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 Thr Leu Pro Ser Lys Glu Lys Phe Thr Ser Leu Leu Val  
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 Ala Thr Leu Thr Tyr Pro Ser His Cys Cys Ala Phe Arg  
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 Phe Glu Asn Phe Ser Lys Gln Cys Glu Ser Thr Val Arg  
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 Lys Ala Asp Asn Glu Thr Leu Tyr Ser Ala Ile Phe Glu  
 315 320 325

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 Glu Asn Glu Leu Ser Gly Trp Asp Tyr Asp Tyr Gly Phe  
 330 335

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 Arg Tyr Lys Leu Thr Val Pro Arg Phe Leu Met Cys Asn  
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 Tyr Asn His Ala Ile Asp Trp Gln Thr Gly Ser Gly Cys  
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 Ser Val Tyr Thr Leu Thr Val Ile Thr Leu Glu Arg Trp  
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cac acc atc acc tat gct gta cag cta gac caa aag cta 1489  
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 Ser Gln Ala Thr Leu Lys Leu Ser Thr Val His Cys Gln  
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cag ccc ata cca ccg aga gcg tta act cac tagcatt 2150  
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                   695                                  700

acaaaattgt gcctaaatat gttttttaaa aagtgtttta gaaaaatatt 2200  
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Gly	Ser	Arg	Cys	Pro	Glu	Pro	Cys	Asp	Cys	Ala	Pro	Asp	Gly	Ala	35	40	45	
Leu	Arg	Cys	Pro	Gly	Pro	Arg	Ala	Gly	Leu	Ala	Arg	Leu	Ser	Leu	50	55	60	
Thr	Tyr	Leu	Pro	Val	Lys	Val	Ile	Pro	Ser	Gln	Ala	Phe	Arg	Gly	65	70	75	
Leu	Asn	Glu	Val	Val	Lys	Ile	Glu	Ile	Ser	Gln	Ser	Asp	Ser	Leu	80	85	90	
Glu	Arg	Ile	Glu	Ala	Asn	Ala	Phe	Asp	Asn	Leu	Leu	Asn	Leu	Ser	95	100	105	
Glu	Leu	Leu	Ile	Gln	Asn	Thr	Lys	Asn	Leu	Leu	Tyr	Ile	Glu	Pro	110	115	120	
Gly	Ala	Phe	Thr	Asn	Leu	Pro	Arg	Leu	Lys	Tyr	Leu	Ser	Ile	Cys	125	130	135	
Asn	Thr	Gly	Ile	Arg	Thr	Leu	Pro	Asp	Val	Thr	Lys	Ile	Ser	Ser	140	145	150	
Ser	Glu	Phe	Asn	Phe	Ile	Leu	Glu	Ile	Cys	Asp	Asn	Leu	His	Ile	155	160	165	
Thr	Thr	Ile	Pro	Gly	Asn	Ala	Phe	Gln	Gly	Met	Asn	Asn	Glu	Ser	170	175	180	
Val	Thr	Leu	Lys	Leu	Tyr	Gly	Asn	Gly	Phe	Glu	Glu	Val	Gln	Ser	185	190	195	
His	Ala	Phe	Asn	Gly	Thr	Thr	Leu	Ile	Ser	Leu	Glu	Leu	Lys	Glu	200	205	210	
Asn	Ile	Tyr	Leu	Glu	Lys	Met	His	Ser	Gly	Ala	Phe	Gln	Gly	Ala	215	220	225	
Thr	Gly	Pro	Ser	Ile	Leu	Asp	Ile	Ser	Ser	Thr	Lys	Leu	Gln	Ala	230	235	240	
Leu	Pro	Ser	His	Gly	Leu	Glu	Ser	Ile	Gln	Thr	Leu	Ile	Ala	Leu	245	250	255	

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Ser Leu Leu Val	Ala Thr Leu Thr Tyr Pro	Ser His Cys Cys Ala
	275	280 285
Phe Arg Asn Leu	Pro Lys Lys Glu Gln Asn	Phe Ser Phe Ser Ile
	290	295 300
Phe Glu Asn Phe	Ser Lys Gln Cys Glu Ser	Thr Val Arg Lys Ala
	305	310 315
Asp Asn Glu Thr	Leu Tyr Ser Ala Ile Phe	Glu Glu Asn Glu Leu
	320	325 330
Ser Gly Trp Asp	Tyr Asp Tyr Gly Phe Cys	Ser Pro Lys Thr Leu
	335	340 345
Gln Cys Ala Pro	Glu Pro Asp Ala Phe Asn	Pro Cys Glu Asp Ile
	350	355 360
Met Gly Tyr Ala	Phe Leu Arg Val Leu Ile	Trp Leu Ile Asn Ile
	365	370 375
Leu Ala Ile Phe	Gly Asn Leu Thr Val Leu	Phe Val Leu Leu Thr
	380	385 390
Ser Arg Tyr Lys	Leu Thr Val Pro Arg Phe	Leu Met Cys Asn Leu
	395	400 405
Ser Phe Ala Asp	Phe Cys Met Gly Leu Tyr	Leu Leu Leu Ile Ala
	410	415 420
Ser Val Asp Ser	Gln Thr Lys Gly Gln Tyr	Tyr Asn His Ala Ile
	425	430 435
Asp Trp Gln Thr	Gly Ser Gly Cys Gly Ala	Ala Gly Phe Phe Thr
	440	445 450
Val Phe Ala Ser	Glu Leu Ser Val Tyr Thr	Leu Thr Val Ile Thr
	455	460 465
Leu Glu Arg Trp	His Thr Ile Thr Tyr Ala	Val Gln Leu Asp Gln
	470	475 480
Lys Leu Arg Leu	Arg His Ala Ile Pro Ile	Met Leu Gly Gly Trp
	485	490 495
Leu Phe Ser Thr	Leu Ile Ala Thr Met Pro	Leu Val Gly Ile Ser
	500	505 510
Asn Tyr Met Lys	Val Ser Ile Cys Leu Pro	Met Asp Val Glu Ser
	515	520 525
Thr Leu Ser Gln	Val Tyr Ile Leu Ser Ile	Leu Ile Leu Asn Val
	530	535 540

Val	Ala	Phe	Val	Val	Ile	Cys	Ala	Cys	Tyr	Ile	Arg	Ile	Tyr	Phe	545	550	555
Ala	Val	Gln	Asn	Pro	Glu	Leu	Thr	Ala	Pro	Asn	Lys	Asp	Thr	Lys	560	565	570
Ile	Ala	Lys	Lys	Met	Ala	Ile	Leu	Ile	Phe	Thr	Asp	Phe	Thr	Cys	575	580	585
Met	Ala	Pro	Ile	Ser	Phe	Phe	Ala	Ile	Ser	Ala	Ala	Phe	Lys	Val	590	595	600
Pro	Leu	Ile	Thr	Val	Thr	Asn	Ser	Lys	Ile	Leu	Leu	Val	Leu	Phe	605	610	615
Tyr	Pro	Val	Asn	Ser	Cys	Ala	Asn	Pro	Phe	Leu	Tyr	Ala	Ile	Phe	620	625	630
Thr	Lys	Ala	Phe	Gln	Arg	Asp	Phe	Leu	Leu	Leu	Leu	Ser	Arg	Phe	635	640	645
Gly	Cys	Cys	Lys	Arg	Arg	Ala	Glu	Leu	Tyr	Arg	Arg	Lys	Glu	Phe	650	655	660
Ser	Ala	Tyr	Thr	Ser	Asn	Cys	Lys	Asn	Gly	Phe	Pro	Gly	Ala	Ser	665	670	675
Lys	Pro	Ser	Gln	Ala	Thr	Leu	Lys	Leu	Ser	Thr	Val	His	Cys	Gln	680	685	690
Gln	Pro	Ile	Pro	Pro	Arg	Ala	Leu	Thr	His						695	700	

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 <212> PRT  
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 35 40 45  
 Ala Phe Arg Gly Leu Asn Glu Val Val Lys Ile Glu Ile Ser Gln  
 50 55 60  
 Ser Asp Ser Leu Glu Arg Ile Glu Ala Asn Ala Phe Asp Asn Leu  
 65 70 75



Leu	Asn	Leu	Ser	Glu	Leu	Leu	Ile	Gln	Asn	Thr	Lys	Asn	Leu	Leu		80	85	90
Tyr	Ile	Glu	Pro	Gly	Ala	Phe	Thr	Asn	Leu	Pro	Arg	Leu	Lys	Tyr		95	100	105
Leu	Ser	Ile	Cys	Asn	Thr	Gly	Ile	Arg	Thr	Leu	Pro	Asp	Val	Thr		110	115	120
Lys	Ile	Ser	Ser	Ser	Glu	Phe	Asn	Phe	Ile	Leu	Glu	Ile	Cys	Asp		125	130	135
Asn	Leu	His	Ile	Thr	Thr	Ile	Pro	Gly	Asn	Ala	Phe	Gln	Gly	Met		140	145	150
Asn	Asn	Glu	Ser	Val	Thr	Leu	Lys	Leu	Tyr	Gly	Asn	Gly	Phe	Glu		155	160	165
Glu	Val	Gln	Ser	His	Ala	Phe	Asn	Gly	Thr	Thr	Leu	Ile	Ser	Leu		170	175	180
Glu	Leu	Lys	Glu	Asn	Ile	Tyr	Leu	Glu	Lys	Met	His	Ser	Gly	Ala		185	190	195
Phe	Gln	Gly	Ala	Thr	Gly	Pro	Ser	Ile	Leu	Asp	Ile	Ser	Ser	Thr		200	205	210
Lys	Leu	Gln	Ala	Leu	Pro	Ser	His	Gly	Leu	Glu	Ser	Ile	Gln	Thr		215	220	225
Leu	Ile	Ala	Leu	Ser	Ser	Tyr	Ser	Leu	Lys	Thr	Leu	Pro	Ser	Lys		230	235	240
Glu	Lys	Phe	Thr	Ser	Leu	Leu	Val	Ala	Thr	Leu	Thr	Tyr	Pro	Ser		245	250	255
His	Cys	Cys	Ala	Phe	Arg	Asn	Leu	Pro	Lys	Lys	Glu	Gln	Asn	Phe		260	265	270
Ser	Phe	Ser	Ile	Phe	Glu	Asn	Phe	Ser	Lys	Gln	Cys	Glu	Ser	Thr		275	280	285
Val	Arg	Lys	Ala	Asp	Asn	Glu	Thr	Leu	Tyr	Ser	Ala	Ile	Phe	Glu		290	295	300
Glu	Asn	Glu	Leu	Ser	Gly	Trp	Asp	Tyr	Asp	Tyr	Gly	Phe	Cys	Ser		305	310	315
Pro	Lys	Thr	Leu	Gln	Cys	Ala	Pro	Glu	Pro	Asp	Ala	Phe	Asn	Pro		320	325	330
Cys	Glu	Asp	Ile	Met	Gly	Tyr	Ala	Phe	Leu	Arg	Val	Leu	Ile	Trp		335	340	345
Leu	Ile	Asn	Ile	Leu	Ala	Ile	Phe	Gly	Asn	Leu	Thr	Val	Leu	Phe		350	355	360

Val	Leu	Leu	Thr	Ser	Arg	Tyr	Lys	Leu	Thr	Val	Pro	Arg	Phe	Leu	365	370	375
Met	Cys	Asn	Leu	Ser	Phe	Ala	Asp	Phe	Cys	Met	Gly	Leu	Tyr	Leu	380	385	390
Leu	Leu	Ile	Ala	Ser	Val	Asp	Ser	Gln	Thr	Lys	Gly	Gln	Tyr	Tyr	395	400	405
Asn	His	Ala	Ile	Asp	Trp	Gln	Thr	Gly	Ser	Gly	Cys	Gly	Ala	Ala	410	415	420
Gly	Phe	Phe	Thr	Val	Phe	Ala	Ser	Glu	Leu	Ser	Val	Tyr	Thr	Leu	425	430	435
Thr	Val	Ile	Thr	Leu	Glu	Arg	Trp	His	Thr	Ile	Thr	Tyr	Ala	Val	440	445	450
Gln	Leu	Asp	Gln	Lys	Leu	Arg	Leu	Arg	His	Ala	Ile	Pro	Ile	Met	455	460	465
Leu	Gly	Gly	Trp	Leu	Phe	Ser	Thr	Leu	Ile	Ala	Thr	Met	Pro	Leu	470	475	480
Val	Gly	Ile	Ser	Asn	Tyr	Met	Lys	Val	Ser	Ile	Cys	Leu	Pro	Met	485	490	495
Asp	Val	Glu	Ser	Thr	Leu	Ser	Gln	Val	Tyr	Ile	Leu	Ser	Ile	Leu	500	505	510
Ile	Leu	Asn	Val	Val	Ala	Phe	Val	Val	Ile	Cys	Ala	Cys	Tyr	Ile	515	520	525
Arg	Ile	Tyr	Phe	Ala	Val	Gln	Asn	Pro	Glu	Leu	Thr	Ala	Pro	Asn	530	535	540
Lys	Asp	Thr	Lys	Ile	Ala	Lys	Lys	Met	Ala	Ile	Leu	Ile	Phe	Thr	545	550	555
Asp	Phe	Thr	Cys	Met	Ala	Pro	Ile	Ser	Phe	Phe	Ala	Ile	Ser	Ala	560	565	570
Ala	Phe	Lys	Val	Pro	Leu	Ile	Thr	Val	Thr	Asn	Ser	Lys	Ile	Leu	575	580	585
Leu	Val	Leu	Phe	Tyr	Pro	Val	Asn	Ser	Cys	Ala	Asn	Pro	Phe	Leu	590	595	600
Tyr	Ala	Ile	Phe	Thr	Lys	Ala	Phe	Gln	Arg	Asp	Phe	Leu	Leu	Leu	605	610	615
Leu	Ser	Arg	Phe	Gly	Cys	Cys	Lys	Arg	Arg	Ala	Glu	Leu	Tyr	Arg	620	625	630
Arg	Lys	Glu	Phe	Ser	Ala	Tyr	Thr	Ser	Asn	Cys	Lys	Asn	Gly	Phe	635	640	645

Pro	Gly	Ala	Ser	Lys	Pro	Ser	Gln	Ala	Thr	Leu	Lys	Leu	Ser	Thr
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Val	His	Cys	Gln	Gln	Pro	Ile	Pro	Pro	Arg	Ala	Leu	Thr	His
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<220>  
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 35 40 45  
 Ala Phe Arg Gly Leu Asn Glu Val Val Lys Ile Glu Ile Ser Gln  
 50 55 60  
 Ser Asp Ser Leu Glu Arg Ile Glu Ala Asn Ala Phe Asp Asn Leu  
 65 70 75  
 Leu Asn Leu Ser Glu Leu Leu Ile Gln Asn Thr Lys Asn Leu Leu  
 80 85 90  
 Tyr Ile Glu Pro Gly Ala Phe Thr Asn Leu Pro Arg Leu Lys Tyr  
 95 100 105  
 Leu Ser Ile Cys Asn Thr Gly Ile Arg Thr Leu Pro Asp Val Thr  
 110 115 120  
 Lys Ile Ser Ser Ser Glu Phe Asn Phe Ile Leu Glu Ile Cys Asp  
 125 130 135  
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 170 175 180  
 Glu Leu Lys Glu Asn Ile Tyr Leu Glu Lys Met His Ser Gly Ala  
 185 190 195  
 Phe Gln Gly Ala Thr Gly Pro Ser Ile Leu Asp Ile Ser Ser Thr  
 200 205 210

Lys	Leu	Gln	Ala	Leu	Pro	Ser	His	Gly	Leu	Glu	Ser	Ile	Gln	Thr	215	220	225
Leu	Ile	Ala	Leu	Ser	Ser	Tyr	Ser	Leu	Lys	Thr	Leu	Pro	Ser	Lys	230	235	240
Glu	Lys	Phe	Thr	Ser	Leu	Leu	Val	Ala	Thr	Leu	Thr	Tyr	Pro	Ser	245	250	255
His	Cys	Cys	Ala	Phe	Arg	Asn	Leu	Pro	Lys	Lys	Glu	Gln	Asn	Phe	260	265	270
Ser	Phe	Ser	Ile	Phe	Glu	Asn	Phe	Ser	Lys	Gln	Cys	Glu	Ser	Thr	275	280	285
Val	Arg	Lys	Ala	Asp	Asn	Glu	Thr	Leu	Tyr	Ser	Ala	Ile	Phe	Glu	290	295	300
Glu	Asn	Glu	Leu	Ser	Gly	Trp	Asp	Tyr	Asp	Tyr	Gly	Phe	Cys	Ser	305	310	315
Pro	Lys	Thr	Leu	Gln	Cys	Ala	Pro	Glu	Pro	Asp	Ala	Phe	Asn	Pro	320	325	330
Cys	Glu	Asp	Ile	Met	Gly	Tyr	Ala	Phe	Leu	Arg					335	340	

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 <212> DNA  
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<400> 5  
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cggtgaatgg ataaataagg	atg gcc ttg ctc ctg gtc tcc	91
	Met Ala Leu Leu Leu Val Ser	
	1 5	

ttg ctg gca ttc ttg ggc acg gga tct gga tgt cat cac	130
Leu Leu Ala Phe Leu Gly Thr Gly Ser Gly Cys His His	
10 15 20	

tgg ctg tgt cat tgc tct aat agg gtc ttt ctc tgc caa	169
Trp Leu Cys His Cys Ser Asn Arg Val Phe Leu Cys Gln	
25 30	

gac agc aag gtg aca gag att ccg acc gac ctc ccc cgg	208
Asp Ser Lys Val Thr Glu Ile Pro Thr Asp Leu Pro Arg	
35 40 45	

aac gcc att gaa ctg agg ttt gtg ctc acc aag ctt cga	247
Asn Ala Ile Glu Leu Arg Phe Val Leu Thr Lys Leu Arg	
50 55	

gtc atc ccg aaa gga tca ttt gct gga ttt gga gac ctg	286
Val Ile Pro Lys Gly Ser Phe Ala Gly Phe Gly Asp Leu	
60 65 70	

gag aaa ata gag atc tct cag aat gat gtc ttg gaa gta 325  
Glu Lys Ile Glu Ile Ser Gln Asn Asp Val Leu Glu Val  
75 80 85

ata gag gca gat gtg ttc tcc aac cta ccc aag ttg cat 364  
Ile Glu Ala Asp Val Phe Ser Asn Leu Pro Lys Leu His  
90 95

gaa att agg att gaa aag gcc aac aat ctt ctg tac atc 403  
Glu Ile Arg Ile Glu Lys Ala Asn Asn Leu Leu Tyr Ile  
100 105 110

aac ccg gag gcc ttc cag aat ctc ccc agt ctc aga tat 442  
Asn Pro Glu Ala Phe Gln Asn Leu Pro Ser Leu Arg Tyr  
115 120

ctg tta ata tcc aac aca ggc att aag cac ttg cca gct 481  
Leu Leu Ile Ser Asn Thr Gly Ile Lys His Leu Pro Ala  
125 130 135

gtt cac aag atc cag tct ctc caa aag gtt cta cta gac 520  
Val His Lys Ile Gln Ser Leu Gln Lys Val Leu Leu Asp  
140 145 150

att caa gat aac ata aac atc cac atc gtt gcc agg aac 559  
Ile Gln Asp Asn Ile Asn Ile His Ile Val Ala Arg Asn  
155 160

tcc ttc atg gga ctg agt ttt gaa agt gtg att tta tgg 598  
Ser Phe Met Gly Leu Ser Phe Glu Ser Val Ile Leu Trp  
165 170 175

ctg agt aag aat ggg att gaa gaa ata cac aac tgt gca 637  
Leu Ser Lys Asn Gly Ile Glu Glu Ile His Asn Cys Ala  
180 185

ttc aac gga act cag cta gat gaa ctg aat cta agc gat 676  
Phe Asn Gly Thr Gln Leu Asp Glu Leu Asn Leu Ser Asp  
190 195 200

aac aat aat ttg gaa gaa ttg cct aat gac gtt ttc cag 715  
Asn Asn Asn Leu Glu Glu Leu Pro Asn Asp Val Phe Gln  
205 210 215

gga gcc tct ggg cca gtc att tta gat atc tca agg aca 754  
Gly Ala Ser Gly Pro Val Ile Leu Asp Ile Ser Arg Thr  
220 225

aag gtc cat tcc tta cca aac cat ggc tta gaa aat ctg 793  
Lys Val His Ser Leu Pro Asn His Gly Leu Glu Asn Leu  
230 235 240

aag aag ctg agg gcc agg tca aca tac cgc ttg aaa aag 832  
Lys Lys Leu Arg Ala Arg Ser Thr Tyr Arg Leu Lys Lys  
245 250

ctc cct aat ctg gac aag ttt gtc acc ctc atg gag gcc 871  
 Leu Pro Asn Leu Asp Lys Phe Val Thr Leu Met Glu Ala  
 255 260 265

agc ctc acc tac ccc agc cac tgc tgt gct ttt gca aac 910  
 Ser Leu Thr Tyr Pro Ser His Cys Cys Ala Phe Ala Asn  
 270 275 280

ttg aag cgg caa atc tct gaa ctt cat cca att tgc aac 949  
 Leu Lys Arg Gln Ile Ser Glu Leu His Pro Ile Cys Asn  
 285 290

aag tct att tta agg caa gat att gat gat atg act caa 988  
 Lys Ser Ile Leu Arg Gln Asp Ile Asp Asp Met Thr Gln  
 295 300 305

att ggg gat cag aga gtc tct ctg ata gat gat gaa ccc 1027  
 Ile Gly Asp Gln Arg Val Ser Leu Ile Asp Asp Glu Pro  
 310 315

agt tat gga aaa gga tct gac atg atg tac aat gaa ttt 1066  
 Ser Tyr Gly Lys Gly Ser Asp Met Met Tyr Asn Glu Phe  
 320 325 330

gat tat gac tta tgt aat gaa gtt gtt gat gtg acc tgc 1105  
 Asp Tyr Asp Leu Cys Asn Glu Val Val Asp Val Thr Cys  
 335 340 345

tca cca aag cca gat gca ttt aat cca tgt gaa gat atc 1144  
 Ser Pro Lys Pro Asp Ala Phe Asn Pro Cys Glu Asp Ile  
 350 355

atg ggg tac aac atc ctc agg gtc ttg ata tgg ttt att 1183  
 Met Gly Tyr Asn Ile Leu Arg Val Leu Ile Trp Phe Ile  
 360 365 370

agc atc ctg gcc att act ggg aac acc aca gtg ctg gtg 1222  
 Ser Ile Leu Ala Ile Thr Gly Asn Thr Thr Val Leu Val  
 375 380

gtc ctg acc aca agc caa tac aaa cta act gtg ccc cgg 1261  
 Val Leu Thr Thr Ser Gln Tyr Lys Leu Thr Val Pro Arg  
 385 390 395

ttt ctt atg tgt aac ctc gcc ttc gct gat ctc tgc ata 1300  
 Phe Leu Met Cys Asn Leu Ala Phe Ala Asp Leu Cys Ile  
 400 405 410

ggc atc tac ttg cta ctt ata gca tca gtt gac atc cat 1339  
 Gly Ile Tyr Leu Leu Leu Ile Ala Ser Val Asp Ile His  
 415 420

acc aag agc cag tac cac aac tat gcc att gac tgg caa 1378  
 Thr Lys Ser Gln Tyr His Asn Tyr Ala Ile Asp Trp Gln  
 425 430 435

aca gga gca ggc tgt gat gct gct ggc ttt ttc act gtc 1417  
 Thr Gly Ala Gly Cys Asp Ala Ala Gly Phe Phe Thr Val  
 440 445

ttt gcc agt gaa ctg tca gtc tac aca ttg aca gcc atc 1456  
 Phe Ala Ser Glu Leu Ser Val Tyr Thr Leu Thr Ala Ile  
 450 455 460

acc cta gaa aga tgg cat acc atc aca cat gct atg caa 1495  
 Thr Leu Glu Arg Trp His Thr Ile Thr His Ala Met Gln  
 465 470 475

ctg gaa tgc aag gtg cag ctc cgg cat gct gcc agc gtc 1534  
 Leu Glu Cys Lys Val Gln Leu Arg His Ala Ala Ser Val  
 480 485

atg gta ttg ggc tgg act ttt gcc ttc gca gct gct ctc 1573  
 Met Val Leu Gly Trp Thr Phe Ala Phe Ala Ala Ala Leu  
 490 495 500

ttc ccc atc ttt ggc atc agt agc tac atg aaa gtg agc 1612  
 Phe Pro Ile Phe Gly Ile Ser Ser Tyr Met Lys Val Ser  
 505 510

atc tgc ctg ccc atg gat atc gac agc cct ttg tca cag 1651  
 Ile Cys Leu Pro Met Asp Ile Asp Ser Pro Leu Ser Gln  
 515 520 525

ctg tat gtt atg gcc ctc ctt gtc ctc aat gtc ctg gcc 1690  
 Leu Tyr Val Met Ala Leu Leu Val Leu Asn Val Leu Ala  
 530 535 540

ttt gtg gtc atc tgt ggc tgc tat acc cac atc tac ctc 1729  
 Phe Val Val Ile Cys Gly Cys Tyr Thr His Ile Tyr Leu  
 545 550

aca gtg agg aat cct acc att gtg tcc tca tca agc gac 1768  
 Thr Val Arg Asn Pro Thr Ile Val Ser Ser Ser Ser Asp  
 555 560 565

acc aag att gcc aag cgc atg gcc aca ctc atc ttc aca 1807  
 Thr Lys Ile Ala Lys Arg Met Ala Thr Leu Ile Phe Thr  
 570 575

gac ttt ctc tgc atg gcc ccc att tca ttc ttt gcc att 1846  
 Asp Phe Leu Cys Met Ala Pro Ile Ser Phe Phe Ala Ile  
 580 585 590

tct gcc tcc ctc aag gtg ccg ctc atc act gtg tcc aag 1885  
 Ser Ala Ser Leu Lys Val Pro Leu Ile Thr Val Ser Lys  
 595 600 605

gcc aag att ctc cta gtt ctg ttc tac ccc atc aat tct 1924  
 Ala Lys Ile Leu Leu Val Leu Phe Tyr Pro Ile Asn Ser  
 610 615

tgt gcc aat cct ttc ctc tac gcc att ttc acc aag aac 1963  
 Cys Ala Asn Pro Phe Leu Tyr Ala Ile Phe Thr Lys Asn  
       620                      625                      630

ttc cgc agg gac ttc ttc atc ctg ctg agc aag ttt ggc 2002  
 Phe Arg Arg Asp Phe Phe Ile Leu Leu Ser Lys Phe Gly  
               635                      640

tgt tat gaa atg caa gcc cag att tac agg aca gaa acc 2041  
 Cys Tyr Glu Met Gln Ala Gln Ile Tyr Arg Thr Glu Thr  
       645                      650                      655

tca tcc gct acc cac aac ttc cat gcc cga aag agc cac 2080  
 Ser Ser Ala Thr His Asn Phe His Ala Arg Lys Ser His  
               660                      665                      670

tgc tcc tca gct ccc aga gtc acc aat agt tac gtg ctt 2119  
 Cys Ser Ser Ala Pro Arg Val Thr Asn Ser Tyr Val Leu  
               675                      680

gtc cct ctt aat cat tca tcc cag aac taaa aatcaatgtg 2160  
 Val Pro Leu Asn His Ser Ser Gln Asn  
       685                      690                      692

aaaatggatc ctcaccttga aagacaatta tgactccttc tgaagagcag 2210

gccatggact aaatggcaat cctactgcac atctcatcta atttaatctc 2260

tctgggtctc tgcattggcag actgatcagg gaccattaat cacccttttg 2310

gctcctctca cacttaaata atggtaacag caaataaaac aaagcaaaac 2360

cgcaca 2366

<210> 6

<211> 692

<212> PRT

<213> Artificial sequence

<220>

<223> deduced sequence

<400> 6

Met Ala Leu Leu Leu Val Ser Leu Leu Ala Phe Leu Gly Thr Gly  
       1                      5                      10                      15

Ser Gly Cys His His Trp Leu Cys His Cys Ser Asn Arg Val Phe  
               20                      25                      30

Leu Cys Gln Asp Ser Lys Val Thr Glu Ile Pro Thr Asp Leu Pro  
               35                      40                      45

Arg Asn Ala Ile Glu Leu Arg Phe Val Leu Thr Lys Leu Arg Val  
               50                      55                      60

Ile Pro Lys Gly Ser Phe Ala Gly Phe Gly Asp Leu Glu Lys Ile  
               65                      70                      75



Glu	Ile	Ser	Gln	Asn	Asp	Val	Leu	Glu	Val	Ile	Glu	Ala	Asp	Val	
				80					85					90	
Phe	Ser	Asn	Leu	Pro	Lys	Leu	His	Glu	Ile	Arg	Ile	Glu	Lys	Ala	
				95					100					105	
Asn	Asn	Leu	Leu	Tyr	Ile	Asn	Pro	Glu	Ala	Phe	Gln	Asn	Leu	Pro	
				110					115					120	
Ser	Leu	Arg	Tyr	Leu	Leu	Ile	Ser	Asn	Thr	Gly	Ile	Lys	His	Leu	
				125					130					135	
Pro	Ala	Val	His	Lys	Ile	Gln	Ser	Leu	Gln	Lys	Val	Leu	Leu	Asp	
				140					145					150	
Ile	Gln	Asp	Asn	Ile	Asn	Ile	His	Ile	Val	Ala	Arg	Asn	Ser	Phe	
				155					160					165	
Met	Gly	Leu	Ser	Phe	Glu	Ser	Val	Ile	Leu	Trp	Leu	Ser	Lys	Asn	
				170					175					180	
Gly	Ile	Glu	Glu	Ile	His	Asn	Cys	Ala	Phe	Asn	Gly	Thr	Gln	Leu	
				185					190					195	
Asp	Glu	Leu	Asn	Leu	Ser	Asp	Asn	Asn	Asn	Leu	Glu	Glu	Leu	Pro	
				200					205					210	
Asn	Asp	Val	Phe	Gln	Gly	Ala	Ser	Gly	Pro	Val	Ile	Leu	Asp	Ile	
				215					220					225	
Ser	Arg	Thr	Lys	Val	His	Ser	Leu	Pro	Asn	His	Gly	Leu	Glu	Asn	
				230					235					240	
Leu	Lys	Lys	Leu	Arg	Ala	Arg	Ser	Thr	Tyr	Arg	Leu	Lys	Lys	Leu	
				245					250					255	
Pro	Asn	Leu	Asp	Lys	Phe	Val	Thr	Leu	Met	Glu	Ala	Ser	Leu	Thr	
				260					265					270	
Tyr	Pro	Ser	His	Cys	Cys	Ala	Phe	Ala	Asn	Leu	Lys	Arg	Gln	Ile	
				275					280					285	
Ser	Glu	Leu	His	Pro	Ile	Cys	Asn	Lys	Ser	Ile	Leu	Arg	Gln	Asp	
				290					295					300	
Ile	Asp	Asp	Met	Thr	Gln	Ile	Gly	Asp	Gln	Arg	Val	Ser	Leu	Ile	
				305					310					315	
Asp	Asp	Glu	Pro	Ser	Tyr	Gly	Lys	Gly	Ser	Asp	Met	Met	Tyr	Asn	
				320					325					330	
Glu	Phe	Asp	Tyr	Asp	Leu	Cys	Asn	Glu	Val	Val	Asp	Val	Thr	Cys	
				335					340					345	
Ser	Pro	Lys	Pro	Asp	Ala	Phe	Asn	Pro	Cys	Glu	Asp	Ile	Met	Gly	
				350					355					360	

Tyr Asn Ile Leu Arg	Val Leu Ile Trp	Phe Ile Ser Ile Leu Ala	365	370	375
Ile Thr Gly Asn Thr	Thr Val Leu Val	Val Leu Thr Thr Ser Gln	380	385	390
Tyr Lys Leu Thr Val	Pro Arg Phe Leu	Met Cys Asn Leu Ala Phe	395	400	405
Ala Asp Leu Cys Ile	Gly Ile Tyr Leu	Leu Leu Ile Ala Ser Val	410	415	420
Asp Ile His Thr Lys	Ser Gln Tyr His	Asn Tyr Ala Ile Asp Trp	425	430	435
Gln Thr Gly Ala Gly	Cys Asp Ala Ala	Gly Phe Phe Thr Val Phe	440	445	450
Ala Ser Glu Leu Ser	Val Tyr Thr Leu	Thr Ala Ile Thr Leu Glu	455	460	465
Arg Trp His Thr Ile	Thr His Ala Met	Gln Leu Glu Cys Lys Val	470	475	480
Gln Leu Arg His Ala	Ala Ser Val Met	Val Leu Gly Trp Thr Phe	485	490	495
Ala Phe Ala Ala Ala	Leu Phe Pro Ile	Phe Gly Ile Ser Ser Tyr	500	505	510
Met Lys Val Ser Ile	Cys Leu Pro Met	Asp Ile Asp Ser Pro Leu	515	520	525
Ser Gln Leu Tyr Val	Met Ala Leu Leu	Val Leu Asn Val Leu Ala	530	535	540
Phe Val Val Ile Cys	Gly Cys Tyr Thr	His Ile Tyr Leu Thr Val	545	550	555
Arg Asn Pro Thr Ile	Val Ser Ser Ser	Ser Asp Thr Lys Ile Ala	560	565	570
Lys Arg Met Ala Thr	Leu Ile Phe Thr	Asp Phe Leu Cys Met Ala	575	580	585
Pro Ile Ser Phe Phe	Ala Ile Ser Ala	Ser Leu Lys Val Pro Leu	590	595	600
Ile Thr Val Ser Lys	Ala Lys Ile Leu	Leu Val Leu Phe Tyr Pro	605	610	615
Ile Asn Ser Cys Ala	Asn Pro Phe Leu	Tyr Ala Ile Phe Thr Lys	620	625	630
Asn Phe Arg Arg Asp	Phe Phe Ile Leu	Leu Ser Lys Phe Gly Cys	635	640	645

Tyr	Glu	Met	Gln	Ala	Gln	Ile	Tyr	Arg	Thr	Glu	Thr	Ser	Ser	Ala
				650					655					660

Thr	His	Asn	Phe	His	Ala	Arg	Lys	Ser	His	Cys	Ser	Ser	Ala	Pro
				665					670					675

Arg	Val	Thr	Asn	Ser	Tyr	Val	Leu	Val	Pro	Leu	Asn	His	Ser	Ser
				680					685					690

Gln Asn

<210> 7

<211> 675

<212> PRT

<213> Artificial sequence

<220>

<223> deduced sequence

<400> 7

Cys	His	His	Trp	Leu	Cys	His	Cys	Ser	Asn	Arg	Val	Phe	Leu	Cys
1				5					10					15

Gln	Asp	Ser	Lys	Val	Thr	Glu	Ile	Pro	Thr	Asp	Leu	Pro	Arg	Asn
				20					25					30

Ala	Ile	Glu	Leu	Arg	Phe	Val	Leu	Thr	Lys	Leu	Arg	Val	Ile	Pro
				35					40					45

Lys	Gly	Ser	Phe	Ala	Gly	Phe	Gly	Asp	Leu	Glu	Lys	Ile	Glu	Ile
				50					55					60

Ser	Gln	Asn	Asp	Val	Leu	Glu	Val	Ile	Glu	Ala	Asp	Val	Phe	Ser
				65					70					75

Asn	Leu	Pro	Lys	Leu	His	Glu	Ile	Arg	Ile	Glu	Lys	Ala	Asn	Asn
				80					85					90

Leu	Leu	Tyr	Ile	Asn	Pro	Glu	Ala	Phe	Gln	Asn	Leu	Pro	Ser	Leu
				95					100					105

Arg	Tyr	Leu	Leu	Ile	Ser	Asn	Thr	Gly	Ile	Lys	His	Leu	Pro	Ala
				110					115					120

Val	His	Lys	Ile	Gln	Ser	Leu	Gln	Lys	Val	Leu	Leu	Asp	Ile	Gln
				125					130					135

Asp	Asn	Ile	Asn	Ile	His	Ile	Val	Ala	Arg	Asn	Ser	Phe	Met	Gly
				140					145					150

Leu	Ser	Phe	Glu	Ser	Val	Ile	Leu	Trp	Leu	Ser	Lys	Asn	Gly	Ile
				155					160					165

Glu	Glu	Ile	His	Asn	Cys	Ala	Phe	Asn	Gly	Thr	Gln	Leu	Asp	Glu
				170					175					180

Leu Asn Leu Ser	Asp 185	Asn Asn Asn Leu	Glu 190	Glu Leu Pro Asn	Asp 195
Val Phe Gln Gly	Ala 200	Ser Gly Pro Val	Ile 205	Leu Asp Ile Ser	Arg 210
Thr Lys Val His	Ser 215	Leu Pro Asn His	Gly 220	Leu Glu Asn Leu	Lys 225
Lys Leu Arg Ala	Arg 230	Ser Thr Tyr Arg	Leu 235	Lys Lys Leu Pro	Asn 240
Leu Asp Lys Phe	Val 245	Thr Leu Met Glu	Ala 250	Ser Leu Thr Tyr	Pro 255
Ser His Cys Cys	Ala 260	Phe Ala Asn Leu	Lys 265	Arg Gln Ile Ser	Glu 270
Leu His Pro Ile	Cys 275	Asn Lys Ser Ile	Leu 280	Arg Gln Asp Ile	Asp 285
Asp Met Thr Gln	Ile 290	Gly Asp Gln Arg	Val 295	Ser Leu Ile Asp	Asp 300
Glu Pro Ser Tyr	Gly 305	Lys Gly Ser Asp	Met 310	Met Tyr Asn Glu	Phe 315
Asp Tyr Asp Leu	Cys 320	Asn Glu Val Val	Asp 325	Val Thr Cys Ser	Pro 330
Lys Pro Asp Ala	Phe 335	Asn Pro Cys Glu	Asp 340	Ile Met Gly Tyr	Asn 345
Ile Leu Arg Val	Leu 350	Ile Trp Phe Ile	Ser 355	Ile Leu Ala Ile	Thr 360
Gly Asn Thr Thr	Val 365	Leu Val Val Leu	Thr 370	Thr Ser Gln Tyr	Lys 375
Leu Thr Val Pro	Arg 380	Phe Leu Met Cys	Asn 385	Leu Ala Phe Ala	Asp 390
Leu Cys Ile Gly	Ile 395	Tyr Leu Leu Leu	Ile 400	Ala Ser Val Asp	Ile 405
His Thr Lys Ser	Gln 410	Tyr His Asn Tyr	Ala 415	Ile Asp Trp Gln	Thr 420
Gly Ala Gly Cys	Asp 425	Ala Ala Gly Phe	Phe 430	Thr Val Phe Ala	Ser 435
Glu Leu Ser Val	Tyr 440	Thr Leu Thr Ala	Ile 445	Thr Leu Glu Arg	Trp 450
His Thr Ile Thr	His 455	Ala Met Gln Leu	Glu 460	Cys Lys Val Gln	Leu 465

Arg	His	Ala	Ala	Ser	Val	Met	Val	Leu	Gly	Trp	Thr	Phe	Ala	Phe	470	475	480
Ala	Ala	Ala	Leu	Phe	Pro	Ile	Phe	Gly	Ile	Ser	Ser	Tyr	Met	Lys	485	490	495
Val	Ser	Ile	Cys	Leu	Pro	Met	Asp	Ile	Asp	Ser	Pro	Leu	Ser	Gln	500	505	510
Leu	Tyr	Val	Met	Ala	Leu	Leu	Val	Leu	Asn	Val	Leu	Ala	Phe	Val	515	520	525
Val	Ile	Cys	Gly	Cys	Tyr	Thr	His	Ile	Tyr	Leu	Thr	Val	Arg	Asn	530	535	540
Pro	Thr	Ile	Val	Ser	Ser	Ser	Ser	Asp	Thr	Lys	Ile	Ala	Lys	Arg	545	550	555
Met	Ala	Thr	Leu	Ile	Phe	Thr	Asp	Phe	Leu	Cys	Met	Ala	Pro	Ile	560	565	570
Ser	Phe	Phe	Ala	Ile	Ser	Ala	Ser	Leu	Lys	Val	Pro	Leu	Ile	Thr	575	580	585
Val	Ser	Lys	Ala	Lys	Ile	Leu	Leu	Val	Leu	Phe	Tyr	Pro	Ile	Asn	590	595	600
Ser	Cys	Ala	Asn	Pro	Phe	Leu	Tyr	Ala	Ile	Phe	Thr	Lys	Asn	Phe	605	610	615
Arg	Arg	Asp	Phe	Phe	Ile	Leu	Leu	Ser	Lys	Phe	Gly	Cys	Tyr	Glu	620	625	630
Met	Gln	Ala	Gln	Ile	Tyr	Arg	Thr	Glu	Thr	Ser	Ser	Ala	Thr	His	635	640	645
Asn	Phe	His	Ala	Arg	Lys	Ser	His	Cys	Ser	Ser	Ala	Pro	Arg	Val	650	655	660
Thr	Asn	Ser	Tyr	Val	Leu	Val	Pro	Leu	Asn	His	Ser	Ser	Gln	Asn	665	670	675

<210> 8

<211> 348

<212> PRT

<213> Artificial sequence

<220>

<223> deduced sequence

<400> 8

Cys	His	His	Trp	Leu	Cys	His	Cys	Ser	Asn	Arg	Val	Phe	Leu	Cys	1	5	10	15
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Gln	Asp	Ser	Lys	Val	Thr	Glu	Ile	Pro	Thr	Asp	Leu	Pro	Arg	Asn	20	25	30
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	----	----

Ala	Ile	Glu	Leu	Arg	Phe	Val	Leu	Thr	Lys	Leu	Arg	Val	Ile	Pro	35	40	45
Lys	Gly	Ser	Phe	Ala	Gly	Phe	Gly	Asp	Leu	Glu	Lys	Ile	Glu	Ile	50	55	60
Ser	Gln	Asn	Asp	Val	Leu	Glu	Val	Ile	Glu	Ala	Asp	Val	Phe	Ser	65	70	75
Asn	Leu	Pro	Lys	Leu	His	Glu	Ile	Arg	Ile	Glu	Lys	Ala	Asn	Asn	80	85	90
Leu	Leu	Tyr	Ile	Asn	Pro	Glu	Ala	Phe	Gln	Asn	Leu	Pro	Ser	Leu	95	100	105
Arg	Tyr	Leu	Leu	Ile	Ser	Asn	Thr	Gly	Ile	Lys	His	Leu	Pro	Ala	110	115	120
Val	His	Lys	Ile	Gln	Ser	Leu	Gln	Lys	Val	Leu	Leu	Asp	Ile	Gln	125	130	135
Asp	Asn	Ile	Asn	Ile	His	Ile	Val	Ala	Arg	Asn	Ser	Phe	Met	Gly	140	145	150
Leu	Ser	Phe	Glu	Ser	Val	Ile	Leu	Trp	Leu	Ser	Lys	Asn	Gly	Ile	155	160	165
Glu	Glu	Ile	His	Asn	Cys	Ala	Phe	Asn	Gly	Thr	Gln	Leu	Asp	Glu	170	175	180
Leu	Asn	Leu	Ser	Asp	Asn	Asn	Asn	Leu	Glu	Glu	Leu	Pro	Asn	Asp	185	190	195
Val	Phe	Gln	Gly	Ala	Ser	Gly	Pro	Val	Ile	Leu	Asp	Ile	Ser	Arg	200	205	210
Thr	Lys	Val	His	Ser	Leu	Pro	Asn	His	Gly	Leu	Glu	Asn	Leu	Lys	215	220	225
Lys	Leu	Arg	Ala	Arg	Ser	Thr	Tyr	Arg	Leu	Lys	Lys	Leu	Pro	Asn	230	235	240
Leu	Asp	Lys	Phe	Val	Thr	Leu	Met	Glu	Ala	Ser	Leu	Thr	Tyr	Pro	245	250	255
Ser	His	Cys	Cys	Ala	Phe	Ala	Asn	Leu	Lys	Arg	Gln	Ile	Ser	Glu	260	265	270
Leu	His	Pro	Ile	Cys	Asn	Lys	Ser	Ile	Leu	Arg	Gln	Asp	Ile	Asp	275	280	285
Asp	Met	Thr	Gln	Ile	Gly	Asp	Gln	Arg	Val	Ser	Leu	Ile	Asp	Asp	290	295	300
Glu	Pro	Ser	Tyr	Gly	Lys	Gly	Ser	Asp	Met	Met	Tyr	Asn	Glu	Phe	305	310	315

Asp Tyr Asp Leu Cys Asn Glu Val Val Asp Val Thr Cys Ser Pro  
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Lys Pro Asp Ala Phe Asn Pro Cys Glu Asp Ile Met Gly Tyr Asn  
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Ile Leu Arg

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